

What is claimed is:

Claim 1. An isolated nucleic acid sequence encoding a polypeptide of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence similarity to SEQ ID NO. 1 and having hydroperoxide lyase (HL) activity.

Claim 2. The isolated nucleic acid sequence of claim 1 wherein the nucleic acid encodes a polypeptide of SEQ ID NO. 1.

Claim 3. The isolated nucleic acid of claim 1 wherein the nucleic acid has the sequence of SEQ ID NO. 2.

Claim 4. An isolated polypeptide having the amino acid sequence of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence similarity to SEQ ID NO. 1 and having HL activity.

Claim 5. A vector comprising a nucleic acid sequence encoding a polypeptide of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence similarity to SEQ ID NO. 1 and having HL activity.

Claim 6. A host cell transformed with a vector comprising a nucleic acid sequence encoding a polypeptide of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence similarity to SEQ ID NO. 1 and having HL activity.

Claim 7. The host cell of claim 6 wherein the host cell is *E. coli*.

Claim 8. A transgenic plant comprising a vector comprising a nucleic acid sequence encoding a polypeptide of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence

similarity to SEQ ID NO. 1 and having HL activity, wherein the nucleic acid is expressed in the plant.

Claim 9. A method for the production of at least one green note compound comprising the steps of:

- a) reacting fatty acid hydroperoxide in the presence of a polypeptide having the amino acid sequence of SEQ ID NO. 1 or a polypeptide having at least about 90% sequence identity to SEQ ID NO. 1 and having HL activity to produce aliphatic aldehydes; and
- b) reacting the aliphatic aldehydes in the presence of isomerase and/or alcohol dehydrogenase.

Claim 10. The method of claim 9 wherein in step (a) the fatty acid hydroperoxide is admixed with a tissue extract obtained from a plant transformed with a vector comprising a nucleic acid sequence encoding the polypeptide of SEQ ID NO. 1 or the polypeptide having at least about 90% sequence similarity to SEQ ID NO. 1 and having hydroperoxide lyase activity.

Claim 11. The method of claim 9 wherein the at least one green note compound is (3-Z) hexenal.

Claim 12. The method of claim 9 wherein the fatty acid hydroperoxide comprises 13-(S)-hydroperoxide linolenic acid, hydrolyzed linseed oil or a combination thereof.

Claim 13. The method of claim 9 wherein the aliphatic aldehyde of step (b) is (2E)-hexenal and/or (3Z)-hexenol.